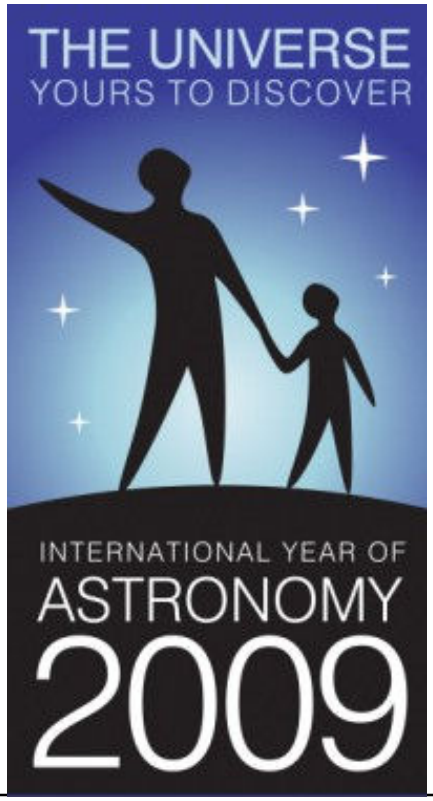

Orbit

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Roger Hill, Editor

We had two sidewalk astronomy events, a meeting, a Levee, a training session, and a lot of fun in the last month.

In this space last month, I talked about how Astronomy, more than just about any of the sciences, is capable of producing awe and wonder. I think that this is what draws many of us to the science in the first place, and then we stick around for the problems, the quiet contemplation, the camaraderie, and sometimes, the thrills.

The thrills? Oh yeah...like charging along a gravel road in the middle of the Gaspe Peninsula, looking for that elusive hole in the clouds, or blasting up the 400 towards Barrie on a foggy November night, looking for that elusive hole in the clouds, or hurtling down the closed off Jolley Cut thinking you'd found a meteorite and breaking your leg.

Perhaps, like thrill seekers addicted to adrenalin, we're addicted to something a little more subtle.

So, what's been going on?

Hopefully, by now, you've been informed that our monthly meetings are moving to the other side of the Skyway, to Discovery Landing at Spencer Smith Park in Burlington.

We've been looking for another place to hold them for a while. The Steam Museum has been our home for over a decade, and while we've had some notable talks and events at the place, there's always been a vague dissatisfaction with the place. From complaints about the heated floor, and the cost per month, there was no doubt that it was time to move on. In fact, this has been a back-burner type of project for the Board for the last few years.

It was the astronomy lectures that we did in the Fall that were the catalyst for this. On the final night, as we were due to put telescopes together, I realized that I had left the projector at home. I left a pile of stuff in the room, and went haring off into the night (there's those "thrills" again...a desperate hope that I wouldn't get a speeding ticket!). When I returned, my intrepid crew of helpers were already there, and Andy had already had a chat with the manager of the place, wondering about the cost of renting it every month.

I got an email from Peter in December, asking about whether we were interested in doing some more of the astronomy presentations. We were, so he and I got together over lunch in mid-December, and, since I already talked about this with the Board, committed us to doing two series of four lectures each, one in the Spring bracketing Easter, and the second in September and October, split by Thanksgiving. The response, according to Peter was enormous, and they had to turn people away. The reviews, as well, were very positive, with a few constructive comments mostly centred around more interaction with the audience.

The City of Burlington also liked the sidewalk astronomy that was done in the park in the summer. They like their facilities to be used by as diverse a range of activities as possible, and they saw us as providing something that is highly unusual and quite different from that which parks of this type normally offer. We've already booked the dates for the summer of 2010!

Peter then asked me if we were interested in meeting there every month, and I said that we were. What particularly piqued his interest was that we had speakers come in every month, and he asked what sort of people we had come in and the level that the talks were at. Well, we've had all types, from telescope vendors to University researchers to highly committed amateurs, in the past year alone, and that will continue into the new year.

With the change of venue comes another opportunity: to revamp the way that meetings are run. Discovery Landing will be doing some advertising for us, and we'll be doing more of this ourselves, too. As a consequence, we can expect more of the general public to attend. What we'd like to do is to increase the diversity of information presented to the people attending.

I've asked a few people to contribute a few minutes every month to a "mini" talk. Five to ten minutes long, people like Andy Blanchard, Gary Colwell, and Ev Rillett with talk about astrophotography, upcoming events, and sky-lore respectively. I'm looking for someone to do a recap of the events that occurred in astronomy since the last meeting. We'll do a raffle, a recap on Centre activities, and as little business as we can before moving to the main speaker.

At the end of the evening, if the weather is conducive, we'll have a look through a telescope or two before heading out to either the attached restaurant, or (far more likely) to a pub called The Queens Head (http://www.thequeenshead.ca/) at 400 Brant Street in Burlington. It's at the corner of Elgin and Brant, one block north of Lakeshore.

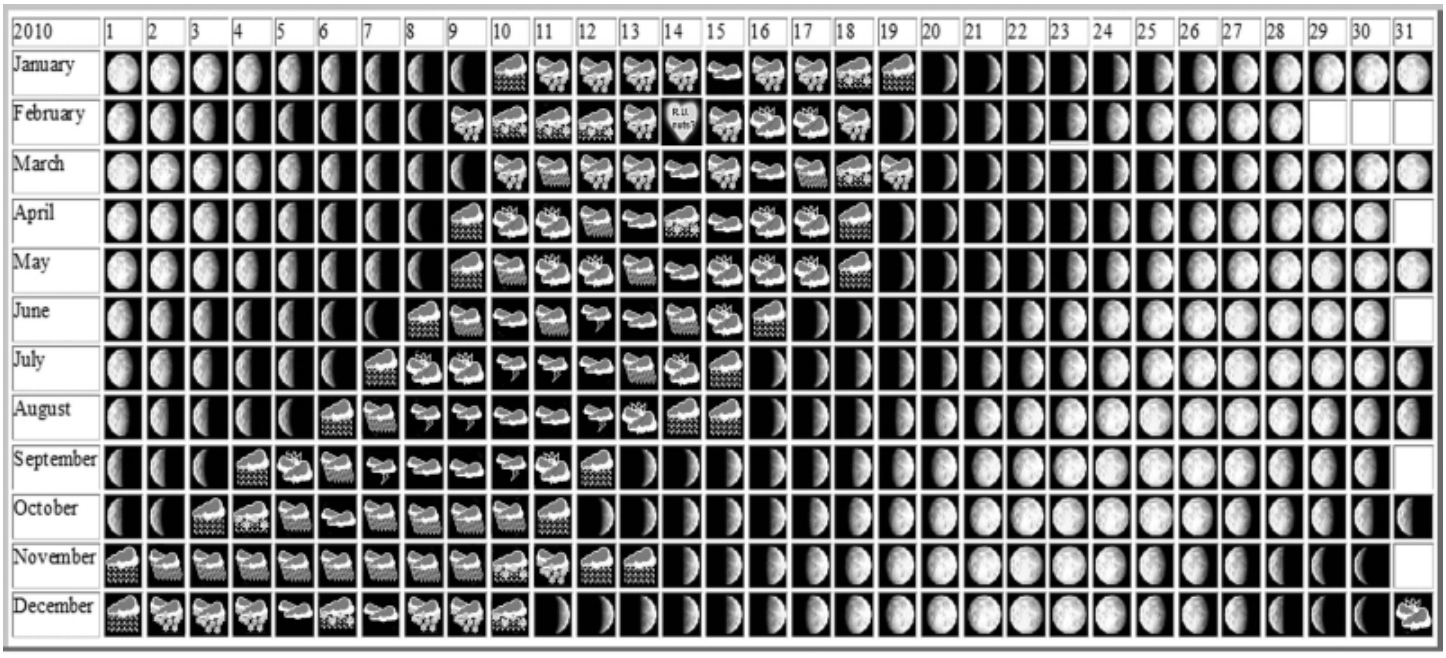
We'll see how this unwinds, but I think that our monthly meetings will be improving as the months go on. Be sure to let me or one of the other board members know what you like, what you don't like, what works (or doesn't!), and any further changes that you'd like to see.

During the meeting last month, I spend a fair bit of time talking about Les Nagy, and his departure to Chile. I'd like to thank you for the indulgence. He will be missed by many, some more than others, but none more so than me, I suspect. I'm looking forward to reading his blog, as he adapts to life in Chile (http://lesnagy.ca/). I'm also looking forward to seeing the images he'll produce from his hyperstarred C11...perhaps he'll end up with more Orbit covers than Gary Colwell!

Speaking of Gary...if you want to hear someone enthusiastic about a new 'scope...ask about his latest Williams Optics purchase. He's the guy who has been responsible for the near total cover of cloud recently, caused by the New Scope curse. Still, it's tough to get upset at him...he's just so happy, and I, for one, am looking forward to looking through it.

Clear skies, one and all,

Roger Hill
Orbit editor and President.



The Sky This Month - January 2010 By Gary Boyle, Ottawa

Star Renewal

It is sometimes hard to convey the feeling of standing under a moonless winter sky. Distant suns of Orion, Taurus, Auriga, Gemini as well as Canis Minor and Major are bright, crisp and overall – mesmerizing. Other than following the nightly dance of the Moon as it orbits Earth or tracking the planets as they slide across the familiar constellations along the ecliptic, one might think that is all that changes in the galaxy. But our Milky Way Galaxy, with its population of an estimated two hundred billion stars is changing. It is the time scale that is the key factor.

The points of light we see at night are stars that have been burning for millions or even billions of years. Our Sun for instance has been ablaze for the past 4.5 billions years and is thought to be only half way on its expected life span. You can almost say that stars are comparable to life on Earth as, they are born; they live very long lives and eventually die when they have consumed their internal fuel. So how are stars created?

Throughout our galaxy, as well as other remote galaxies, reddish or pinkish patches of molecular gas and dust called emission nebulae can be observed. These nebulas can measure in the tens of light years across and are essentially – stellar nurseries. Within the time frame of millions of years, various regions of the nebula will collapse upon itself. Acting as a gigantic snowball, the small pockets in the nebula condenses the dust and gas to eventually form a gravitational field. With gravitational forces increasing, the rate of stellar growth continues until the star is so large that internal temperatures reached the point where thermonuclear reaction occurs and the star ignites. It is these young hot stars that cause this emission nebula to glow from within.

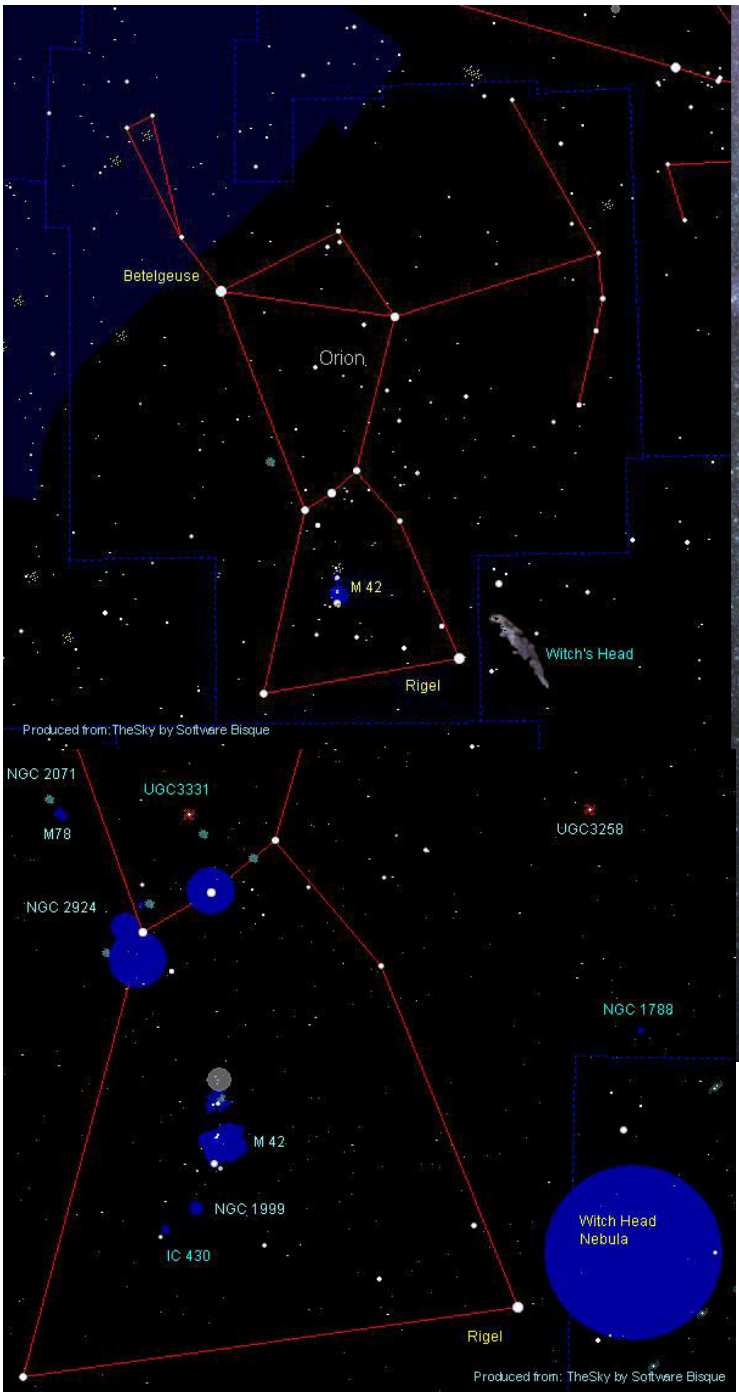
A perfect example of stellar evolution is the Orion Nebula which forms the sword hanging down the mythological Hunter's belt. At a mere 1,500 light years from us, M42 can be studied and photographed in great detail. Even the Hubble Space Telescope could not resist a peak. This 4th magnitude object can even be glimpsed from moderate light polluted suburbs. Its 42 light year width shows up nicely in a low power eyepiece. Located at the centre of the nebula is the Trapezium. These four bright newly formed stars light up the rest of the nebula as I have earlier explained. Now try looking for a curved arm on the east and west side of the Orion nebula. Termed the "bat's wings", its delicate structure will require greater aperture. But no matter what scope you are using to show your family or neighbour, you can say – with confidence that dozens of future suns are growing in there right now at its core.

The Flame Nebula is another emission nebula what is being illuminated from within. Photos will reveal its reddish nature to add to its name sake. The young stars that are responsible for the Flame's internal light, seems to be perfectly hidden behind a portion of dense gas, much like fireflies behind a tree truck. NGC 2024 is about the same distance as the Orion Nebula and is part of Orion's gigantic molecular cloud – a structure that takes in a huge chunk of Orion's territory. To the upper right of the photo are reflection nebulae.

A little more than a degree south and a little to the east is the reflection nebula NGC 1999. Reflection nebulas tend to show up as blue which is a contrast from the reddish emission variety. NGC 1999 is being lit be a nearby star much like log lights up with a flashlight at night. The ghostly portion of this cloud is the clump of dense cloud that does not permit light to enter. In the classic image courtesy of the Hubble Space Telescope, the dark portion looks like an old skeleton key door lock.

For a ghoulish reflection – look about two degree west of brilliant Rigel. The Witch's Head nebula is a long six degree slender stretch of gas. Catalogued as IC 2118, the cloud that might be an ancient super nova remnant and takes on the uncanny resemblance of a Witch – pointy nose and long chin. Rigel (Orion's right foot) is a supergiant star that shines 40,000 times that of our Sun and is so bright, it lights up the nebula some 40 light years away. However, Rigel seems to be on its last legs so to speak. It appears Rigel is fusing helium into carbon and oxygen.

Another bright star that is losing its strength is Betelgeuse. Orange-yellow in colour, it marks Orion's left shoulder. If we replaced our Sun with Betelgeuse, it would stretch as wide as the Asteroid Belt located between Mars and Jupiter. Betelgeuse is only a few million years old, but because of its size and brightness, has used up a lot of fuel in a short amount of time. Astronomers believe that Alpha Orionis will soon go supernova. The question is when. At 640 light years away, we should be at a safe distance.



Throughout the month, keep following the red planet Mars as it moves westward (retrograde) with the stars. On January 29th it will be at opposition and therefore closest to the Earth since its last opposition the end of December 2007. At opposition, it will rise when the sun sets. On the 29th Mars will be over 99 million kilometers from Earth, a far cry from the closest ever approach on Aug 27, 2003 when it was about 56 million kilometers.

But still, great views of Martian landmarks should reveal themselves in telescopes. Try your hand at photographing our planetary neighbour before our distance increases after January 29th. The first week of February will see Mars come within 3.5 degrees north of M44 - the Beehive cluster. The next closest approach occurs on March 3, 2012.

Saturn is now in the constellation Virgo and rises around midnight local time at the beginning of January. Its rings will be tilted to 4.9 degrees. Alas as we greet Saturn in the east, we say farewell to Jupiter in the southwest as it set mid evening.

The full Wolf Moon will occur on January 30th. It will be the largest moon of the year and Mars will appear seven degrees north of it.

Till next month, clear skies everyone.

Letters from a Sidewalk Astronomer Mark Pickett.

Sunday, December 6, 2009

Last night, I was at Westfield for the Christmas Nights. It was partly cloudy, with Jupiter going behind the clouds and reappearing several times, so people were told different things about the reflector or the clouds when it was impossible to see the planet. I think about 150 people viewed the planet Jupiter, and some people viewed several times in the course of the night. I was there for about four and a half hours without a break.

I used a reflector that looked old, but wasn't. It was about 6 years old and made in Guelph, Sudbury and Waterdown. A lot of people were amazed at the site of the reflector, and asked about it.

One guy has a friend in San Francisco who took classes from John Dobson!

What I was upset about this - ***no one showed up***!!!!!! It's ridiculous to think that one person was all the club could send! Go to Westfield next time for a good time under the stars. Next week, there will a sign and a lantern in the square for the people to see. I will be there too, so look for me.

Sunday, December 13, 2009

Ed Mizzi and I went to Westfield for the second of the Christmas Nights, staying from 4:30 to 9:00. We had Ed's refractor (120-mm Sky-Watcher, H-EQ5) and my 260-mm f6.6 reflector. We both had binoculars too, but in my case, I didn't use them. Andy could not make it, unfortunately.

We had a blast for four hours! The crowds were huge and they didn't let up at all for 3 hours. We had about 300 people look though each scope. Maybe more, maybe less, but all I could do was look at the people lined ten deep and say "Look at Jupiter and the four moons", over and over.

In other words, we had a lot of fun, Westfield Heritage Village had a lot of fun, and I think we should do it again next week.

By the way, Ed was living in Waterdown for 27 years, and it was his first time to Westfield. I think everybody should go to look at the stuff from the past, and reflect on the future.

Saturday, December 19, 2009

It looks bad for Sidewalk Astronomy at Westfield tonight. I will go anyway, and perhaps set up the scope, but I think that nothing will be visible for hours due to clouds. I hope I am mistaken, but probably not!

Sunday, December 20, 2009

My daughter and I went to Westfield, hoping that the cloudy evening would turn into to a beautiful night. Oh well, it was cloudy, through and through. We had a few interesting talks to parent and kids, but that was all.

Going Remote—Andy Blanchard

I had the wonderful opportunity to travel to Alain Maury's place in the Atacama Desert in March of 2008. The trip was arranged by Steve Barnes a fellow member of the local Hamilton RASC just outside of Toronto. The trip was as far as an amateur astronomer can go without actually going into space. The Atacama is said to be 10,000 time's drier then Death Valley and at 9000 feet the seeing is in the .28 a/sec range. With 360 clear nights per year and on average 4 minutes of rainfall per year, the location has long been the holy grail of astrophotography.

The sky's are dark enough that the milky way can cast a shadow, and very dry and cold at night. I have often said the environment is ok to experience once but I don't think I would ever return. Yet to have those skies every night would that not be nice. Well about a year later that impossibility started to become a possibility.

By chance a friend of mine was beginning his own research project and was shipping equipment back to Alain's place in Chile and I was able to secure some room in his shipping container for my stuff. So after about 40 seconds of consideration I agreed. I quickly gathered and packed all my equipment for the long trip back to Chile.

I was lucky enough to already own what is probably one of the best mounts I will ever have, a Paramount ME. I knew it had to go south, but I had a really hard time convincing myself to part with it. Yet the prospect of being remote, well the dark sky's won. I had a C14 Hyperstar setup on the Paramount, but for the extremes of temperature the Atacama has on a daily basis I decided to have it modified.

The C14 went off to Kevin Hobbs a local builder of RC's and C-14 modifications. The rear cell was drilled and three fans inserted, a software bisque locking collar and a carbon fibre tube mode was completed. Now I had a great scope that had been converted into a C-14 Hyperstar F1.9 imaging daemon.

The next and most important decision was the selection of camera. Well you can imagine I am sure that at this point things are starting to get expensive, and I had not even purchased a dome yet. Due to the restrictions of imaging from the business end of the C-14 there are not a lot of choices in cameras without restricting light into the bucket. The camera I choose was the QHY8. A believe a lot of camera for the dollar and with some pretty impressive results, already in from top astro-imagers. I made the purchase from Starizona, who by the way are outstanding in their customer support. Lastly I purchased a KW Quick guider from KW Telescopes, again a great company to do business with.

The home for my equipment came down to a simple choice, my friend Steve Barnes was having clamshells built for his research project he was working on, and I ended up with a great deal on a 12' completely robotic clamshell.

My goal was to be completely robotic, and having never been down that road there were a few road bumps along the way. I arrived at the shippers one cold winter morning in March 2009 and left all of my equipment already packed once by me, to be packed into the shipping container, probably never to never be seen by me again. I could not help feeling like I was sending one of my children off to University again, the cost being somewhat similar to a four year degree program, including accommodation and stuff.

The shipping process is a long one. The items left in March 09 and arrived in Chile three months later. An important note here is that Chile has a 30% duty on everything. So be prepared to write some big cheques. Alain Maury is an extraordinary man who runs a very unique property. A great retreat for Astronomers, with four rental homes, a small observatory farm. I believe he looks after 11 observatories at this time.

The cost of having my equipment and clamshell setup and hooked to the internet was astonishingly inexpensive. I will not mention the price here, as Alain is in transition and easy to deal with, so you can make your own deal. Within about 60 days I was able to access the scope and do some crude photos.

My first job was to select a remote observatory program. I had long before decided that I wanted lots of redundancy so I shipped four computers all loaded with The Sky 6, MaximDL 5, Images Plus, and Photoshop. Yet the question was what remote software package to use. Alain was very helpful and provided a list of three companies', CCD Commander, CCD Auto Pilot and ACP.

I guess it would be best to describe what robotic programs are all about. Robotic software is kind of like an orchestra leader for your imaging. A good program will check the weather, open your dome, home the mount, image all night, close the dome and shut all power down. After about 9 months of tinkering, I have a completely different opinion on what this type of software can do. Robotic software is all about telling your equipment what you need imaged and going to bed. I believe a real good program will manage the weather the mount and the cameras all night without your help.

I tried all three programs that Alain suggested, giving each a 30 to 60 day trial. All three offer full versions for 60 day trials. CCD Commander was my first attempt and it is an inexpensive choice, and for the most part simple to use. A bare bones package that gets the job done and if you're on a tight budget as it does require your attention. A good choice if you like to watch your equipment working away all night long.

My second attempt was with CCD Autopilot a great program with not such a great level of support. As it turned out the problems I had encountered had nothing to do with their program but more to do with the drivers on my cameras. Yet I found the people there to be aggressive and angry. In fact on more than on occasion the correspondence from the support people became so aggressive they chased me away. If you want a great program I recommend it, if you want terrible customer service I can't imagine worse.

The last choice was in fact the best choice in the end. ACP is a program that has what can only be stated as a 1st class remote desktop. The documentation and support that ACP provided quickly resolved all of my technical problems. Not only did the support jump in and help me, but other owners quickly also jumped in and wrote scripts for me. I have met great people through ACP and, likely, life long friends.

One of the features that ACP provides is a web based access so I can share my observatory with friends without fear of them causing any damage. In closing I want to thank a few people who helped make all of this happen:
Steve Barnes, Kevin Hobbs, Dean and Scott at Starizona, Brady of KW Telescope, Alain Maury, and Andria Blanchard

The Observatory is now completely robotic and has been also been named the Reynolds / Meehan Observatory, after the two people who made this dream a possibility. Many years ago they trusted in me and supported my business. Today because of that trust I have achieved a life long goal of having my dream in the biggest sky I can imagine. Thanks Steve and Chris.

Top 5 Astronomy Stories of the last 10 years From the Discovery Channel

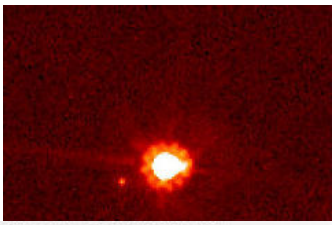
#5: Hubble gets to grips with Dark Energy:

In 2002, the Hubble Space Telescope was upgraded with a new instrument, the Advanced Camera for Surveys, that revealed the presence of a mysterious force called "dark energy."

The camera was set up to help researchers understand why Type Ia supernovae were dimmer than expected. Hubble's observations of these supernovae discovered that they weren't dimmer because the stars were different (they should all explode with the same brightness). The only explanation was that the universe's expansion was unexpectedly and inexplicably speeding up. This accelerated expansion was making the light dim over vast cosmic distances.

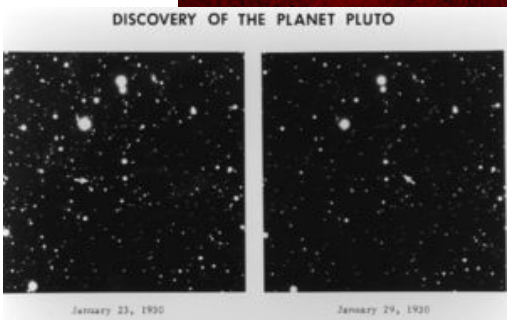
Hubble's discovery led to a better understanding of what dark energy is -- an invisible force that opposes gravity, causing the universe's expansion to speed up.

#4: Eris discovered, Pluto demoted:



In January 2005, Mike Brown and his team at Palomar Observatory, Calif. discovered 136199 Eris, a minor body that is 27 percent bigger than Pluto. Eris had trumped Pluto and become the 9th largest body known to orbit the sun.

In 2006, the International Astronomical Union (IAU) decided that the likelihood of finding more small rocky bodies in the outer solar system was so high that the definition "a planet" needed to be reconsidered. The end result: Pluto was reclassified as a dwarf planet and it acquired a "minor planet designator" in front of its name: "134340 Pluto."



Mike Brown's 2005 discovery of Eris was the trigger that changed the face of our solar system, defining the planets and adding Pluto to a growing family of dwarf planets.

#3: Dark matter detected:

In the summer of 2006, astronomers made an announcement that helped humans understand the cosmos a little better: They had direct evidence confirming the existence of dark matter -- even though they still can't say what exactly the stuff is.

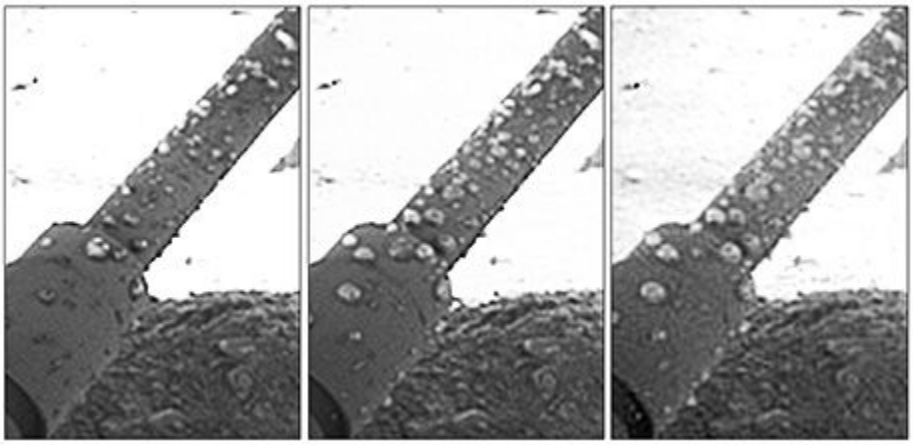
The unprecedented evidence came from the careful weighing of gas and stars flung about in the head-on smash-up between two great clusters of galaxies in the Bullet Cluster.

Until then, the existence of dark matter was inferred by the fact that galaxies have only one-fifth of the visible matter needed to create the gravity that keeps them intact. So the rest must be invisible to telescopes: That unseen matter is "dark."

The observations of the Bullet Cluster, officially known as galaxy cluster 1E0657-56, did not explain what dark matter is. They did, however, give researchers hints that dark matter particles act a certain way, which they can build on.

#2: Mars surface gives up signs of water

In 2008, NASA's Mars Phoenix lander touched down on the Red Planet to confirm the presence of water and seek out signs of organic compounds.



Eight years before, the Mars Global Surveyor spotted what appeared to be gullies carved into the landscape by flowing water. More recently, the Mars Expedition Rovers have uncovered minerals that also indicated the presence of ancient water. But proof of modern-day water was illusive.

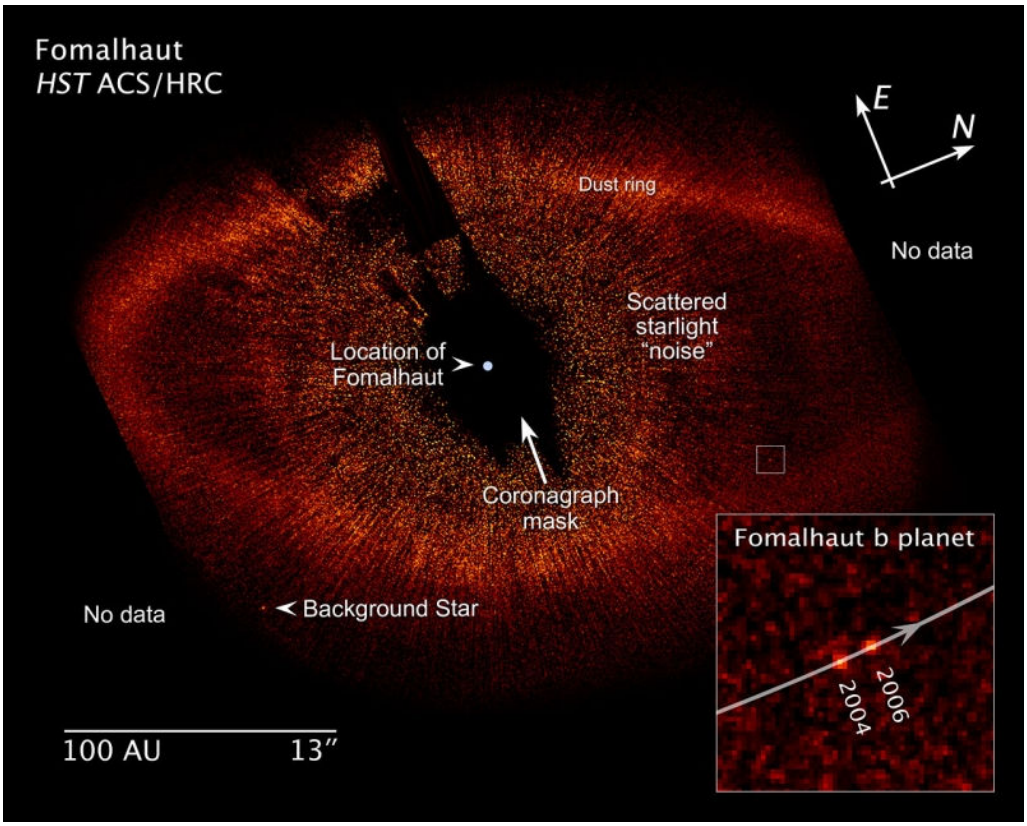
Then Phoenix, planted on the ground near the North Pole, did some digging for samples to analyze. During one dig, the onboard cameras spotted a white powder in the freshly dug soil. In comparison images taken over the coming days, the powder slowly vanished. After intense analysis, the white powder was confirmed as water ice.

This discovery not only confirmed the presence of water on the Red Planet, it reenergized the hope that some kind of microbial life might be using this water supply to survive.

#1: Alien Planets spotted directly

The first alien planets -- called exoplanets -- were being detected in the early 1990s, but not directly. In 2000, astronomers detected a handful by looking for a star's "wobble," or a star's slight dimming as the exoplanet passed in front of it. Today we know of 400 exoplanets.

In 2008, astronomers using the Hubble Space Telescope and the infrared Keck and Gemini observatories in Hawaii announced that they had "seen" exoplanets orbiting distant stars. The two observatories had taken images of these alien worlds.



The Keck observation was the infrared detection of three exoplanets orbiting a star called HR8799, 150 light-years from Earth. Hubble spotted one massive exoplanet orbiting the star Fomalhaut, 25 light-years from Earth.

These finds pose a profound question: How long will it be until we spot an Earth-like world with an extraterrestrial civilization looking back at us?

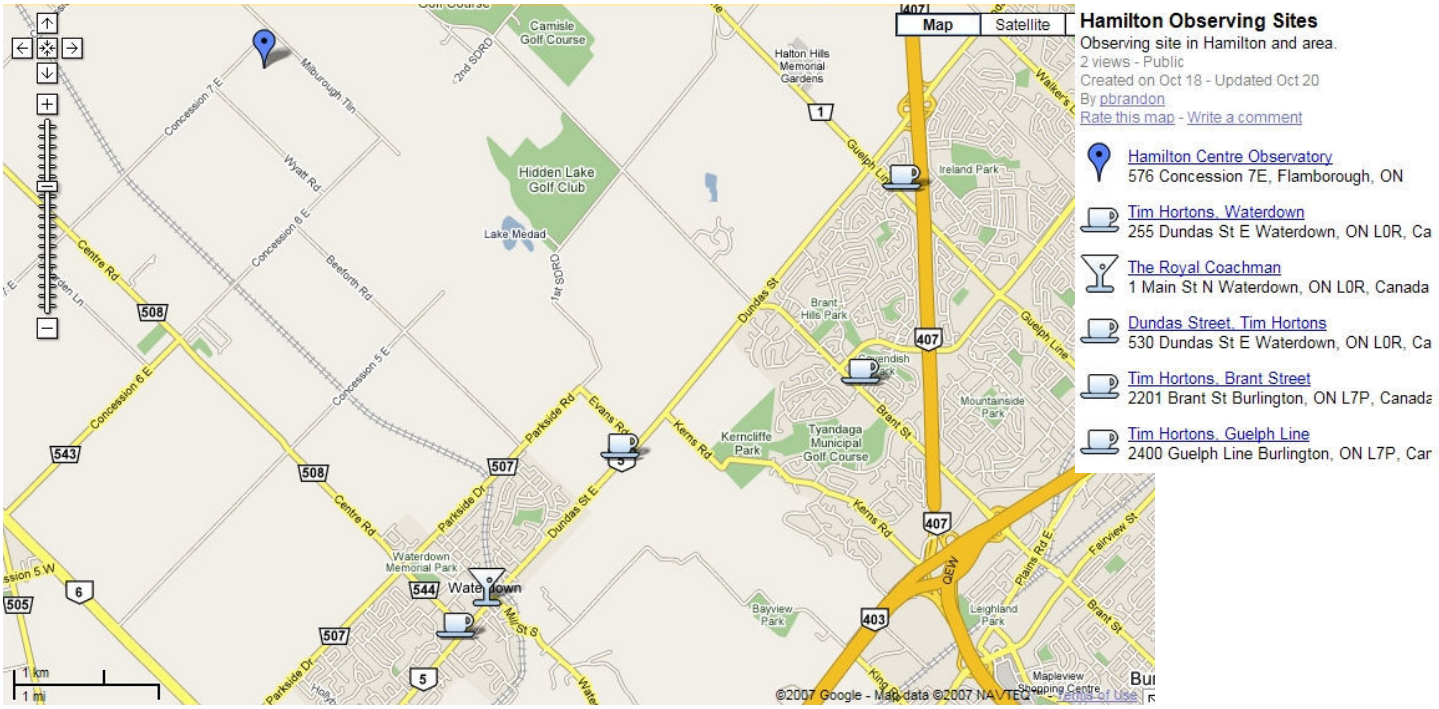
What you missed last Month!

We had a general meeting with Brady Johnson as our guest speaker, we had a Sidewalk Astronomy event, and we had a Levee at the Observatory.

Enjoy the pictures!





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Front Cover and What you Missed pictures by Roger Hill, except for Sidewalk Astronomy pictures...they’re from Ed Mizzi, and the image of Andy's telescope is by Alain Maury.